Claim 23 (first amendment - indicated allowable). A method of controlling the power in a high energy electromagnetic treatment system, the system utilizing a microwave waveguide having an input and multiple outputs,

the method comprising locating an impedance post in the waveguide between the input and at least two outputs,

and moving at least a selective probe located in the waveguide between said power divider and one of said at least two outputs to selectively set said power through its respective output.

REMARKS

In response to the examiner's indication that claims 2, 3, 5, 11, 12, 14, 20, and 21 would be allowable if rewritten into independent form including all of the limitations of the base claim and enter intervening claims, applicant has modified these claims into their indicated condition for allowance.

In respect to the examiner's rejection of claims 1, 4, 7, 13, 15, 19, 22, and 23 under 35 USC 102(b) as being anticipated by Zimmerman, and claims 6, 8, 9, 10, 16, 17, and 18 under 35 USC 103 as being obvious over Zimmerman, applicant respectfully requests the examiner's reconsideration of this rejection.

The presently claimed invention relates to a power divider network for a high energy high power electromagnetic

treatment system (see pg 1 lns 6, 10, 21, pg 2 ln 13, pg 4 ln 20, pg 5 ln 21, pg 7 ln 7, etc.). The invention dynamically adjusts the power division ratios within this high power electromagnetic energy microwave system (see pg 8 lns 5-6, 17, pg 13 ln 9, etc.). The invention thus relates to a power divider so as to adjust the power through the multiple outputs of a microwave guide.

In contrast, the cited Zimmerman reference relates to the coupling of an antenna to plural receivers so as to provide two radio frequency output signals (col 1 lns 10, 12, 16, 22, 24, 48, 49, col 2 lns 6, 33, col 3 lns 8, 25, etc.). This provides for filtered signals that are very low powered signals (col 1 ln 10, col 2 lns 10, 27, 31, 33, 35, 44, 45, col 3 lns 2, 18, 21, 22, 66, col 4 lns 2, 12, 53, etc.).

This use of a lower powered antenna coupler to plural receivers is in a totally distinct field from that of the present invention (see attached inventor declaration).

To illuminate this distinctiveness, applicant has amended the pertinent claims to include that the power divider is utilized "in a high energy electromagnetic treatment system", thus to clarify the distinctiveness of the claimed power divider from the low energy coupling of an antenna to a receiver of the Zimmerman reference.

It is noted that it is not believed suitable to attach Zimmerman to a high energy electromagnetic treatment

system in that by being a filter, Zimmerman will lose efficiency by turning energy into heat. Further, any power which is reflected in Zimmerman will alter the characteristic wave impedance of the device causing further complications.

In view of the above, applicant respectfully requests the examiner's reconsideration of the Zimmerman based rejections and allowance of the presently pending claims.

Favorable action is solicited.

Respectfully solicited,

WILLIAM LIGHTBODY
William S. Lightbody (29,557)

APPENDIX A

Claim 1. A power divider for a microwave waveguide utilized in a high energy electromagnetic treatment system, the waveguide having an input and multiple outputs,

the divider comprising an impedance post, said impedance post being located in the waveguide between the input and at least two outputs,

A1

at least one power selective probe, said power selective probe(s) being respectively located in the waveguide between said impedance post and one of said at least two outputs,

and adjustment means to selectively set said power selective probe(s) so as to alter the power through its respective output.

Claim 2. A power divider for a microwave waveguide having an input and multiple outputs,

the waveguide has a lateral cross-section and a longitudinal axes between said impedance post, and said power selective probe,

the divider comprising an impedance post, said impedance post being located in the waveguide between the input and at least two outputs,

at least one power selective probe, said power selective probe(s) being respectively located in the waveguide between said impedance post and one of said at least two outputs,

adjustment means to selectively set said power selective probe(s) so as to alter the power through its respective output,

and said power selective probe operating perpendicular to such longitudinal axes across the lateral cross section.

Claim 3. A power divider for a microwave waveguide having an input and multiple outputs,

the divider comprising an impedance post, said impedance post being located in the waveguide between the input and at least two outputs,

at least one power selective probe, said power selective probe(s) being respectively located in the waveguide between said impedance post and one of said at least two outputs,

adjustment means to selectively set said power selective probe(s) so as to alter the power through its respective output,

said power selective probe comprising a capacitive probe, said capacitive probe being flanked by a pair of inductive members,

and each pair of said inductive members extending across the lateral cross section located on either side of said capacitive probe.

A'

Claim 4. A power divider of claim 1 wherein said selective probe is variably altered by an adjustment means.

Claim 5. A power divider for a microwave waveguide having an input and multiple outputs,

the divider comprising an impedance post, said impedance post being located in the waveguide between the input and at least two outputs,

at least one power selective probe, said power selective probe(s) being respectively located in the waveguide between said impedance post and one of said at least two outputs,

adjustment means to selectively set said power selective probe(s) so as to alter the power through its respective output,

selective probe is variably altered by an adjustment means, and

said adjustment means being by physical movement of said power selective probe.

Claim 6. A power divider of claim 4 characterized by said alterations being preset by physical replacement of said power selective probe.

Claim 7. A power divider of claim 1 characterized by two outputs.

Claim 8. A power divider of claim 1 characterized by the distance between said impedance post and said power selective probe being within 0.1 of 91% of the wavelength in the waveguide at the center frequency of the operating bandwidth.

Claim 9. A power divider of claim 8 further characterized by the distance between said impedance post and said power selective probe is 91% of the wavelength in the waveguide at the center frequency of the operating bandwidth.

Claim 10. A power divider of claim 1 characterized by said impedance post having a diameter, said diameter being

4.4% of the wavelength in the waveguide at the center frequency of the operating bandwidth.

Claim 11. A power divider for a microwave waveguide having an input and multiple outputs,

the divider comprising an impedance post, said impedance post being located in the waveguide between the input and at least two outputs,

A1

at least one power selective probe, said power selective probe(s) being respectively located in the waveguide between said impedance post and one of said at least two outputs,

adjustment means to selectively set said power selective probe(s) so as to alter the power through its respective output,

there being two power selective probes,

the waveguide having an electrical center of the power divider junction, such center being described by the intersection of the input power axis and the axes of power output from the power divider to said two power selective probes,

and said impedance post being located within an area described by the circle of origin at the electrical center of the power dividing junction and a radius of 3.5" therefrom.

Claim 12. A power divider for a microwave waveguide having an input and multiple outputs,

the divider comprising an impedance post, said impedance post being located in the waveguide between the input and at least two outputs,

A1

at least one power selective probe, said power selective probe(s) being respectively located in the waveguide between said impedance post and one of said at least two outputs,

adjustment means to selectively set said power selective probe(s) so as to alter the power through its respective output, and

said power selective probes being located at least 1.5 wavelength in the waveguide within 0.1% of the center frequency of the operating bandwidth from any component located along the longitudinal axis of the waveguide.

Claim 13. A power divider for a microwave waveguide utilized in a high energy electromagnetic treatment system, the waveguide having an input and two outputs,

the divider comprising an impedance post, said impedance post being located in the waveguide between the input and at both outputs,

a first power selective probe, said first power selective probe being respectively located in the waveguide between said impedance post and a first of the outputs,

adjustment means to selectively set said first power selective probe so as to alter the power through its respective first output,

A4

a second power selective probe, said second power selective probe being respectively located in the waveguide between said impedance post and a second of the outputs,

and selective means to selectively set said second power selective probe so as to alter the power through its respective second output.

Claim 14. A power divider for a microwave waveguide having an input and multiple outputs,

the divider comprising an impedance post, said impedance post being located in the waveguide between the input and at least two outputs,

at least one power selective probe, said power selective probe(s) being respectively located in the waveguide between said impedance post and one of said at least two outputs,

adjustment means to selectively set said power selective probe(s) so as to alter the power through its respective output,

the waveguide having a lateral cross-section, said cross-section having a longitudinal axes between said first power selective and said second power selective probe,

A4

and said first and second power selective probes operating perpendicular to such longitudinal axes across the lateral cross section.

Claim 15. A power divider of claim 1 characterized by each of said first and second power selective probes each comprising a capacitive probe, said capacitive probe being flanked by a pair of inductive members,

and each pair of said inductive members extending across the lateral cross section located on either side of said capacitive probe.

Claim 16. A power divider of claim 1 characterized by the distance between said impedance post and each of said first and said second power selective probes being within 0.1 of 91% of the wavelength in the waveguide at the center frequency of the operating bandwidth.

Claim 17. A power divider of claim 13 characterized by said impedance post having a diameter, said diameter being 4.4% of the wavelength in the waveguide at the center frequency of the operating bandwidth.

Claim 18. A power divider of claim 1 characterized in that at least one of said power selective probes is located at least 1.5 wavelength in the waveguide within 0.1% of the center frequency of the operating bandwidth from any component located along the longitudinal axis of the waveguide.

A1

Claim 19. A power divider for a microwave waveguide utilized in a high energy electromagnetic treatment system, the waveguide having an input and multiple outputs,

the divider comprising an impedance post, said impedance post being located in the waveguide between the input and at least two outputs,

a first power selective capacitive probe, said first power selective capacitive probe being respectively located in the waveguide between said impedance post and a first of said outputs,

selective means to selectively set said first power selective capacitive probe so as to alter the power through its respective first output,

said first capacitive probe being flanked by a first pair of inductive members,

each first pair of said inductive members extending across the lateral cross section located on either side of said first capacitive probe,

A4

a second power selective capacitive probe, said second power selective capacitive probe being respectively located in the waveguide between said impedance post and a second of said the outputs,

selective means to selectively set said second power selective capacitive probe so as to alter the power through its respective second output,

said second capacitive probe being flanked by a second pair of inductive members,

and each second pair of said inductive members extending across the lateral cross section located on either side of said second capacitive probe.

Claim 20. A power divider for a microwave waveguide having an input and multiple outputs,

the divider comprising an impedance post, said impedance post being located in the waveguide between the input and at least two outputs,

at least one power selective probe, said power selective probe(s) being respectively located in the waveguide between said impedance post and one of said at least two outputs,

adjustment means to selectively set said power selective probe(s) so as to alter the power through its respective output,

A\

the waveguide having a lateral cross-section, said cross-section having a longitudinal axes between said impedance post and said first and second capacitive power selective probes,

and said power selective probes operating perpendicular to such longitudinal axes across the lateral cross section.

Claim 21. A power divider for a microwave waveguide utilized in a high energy electromagnetic treatment system, the waveguide having an input and multiple outputs,

the divider comprising an impedance post, said impedance post being located in the waveguide between the input and at least two outputs,

a first power selective capacitive probe, said first power selective capacitive probe being respectively located in

the waveguide between said impedance post and a first of said outputs,

selective means to selectively set said first power selective capacitive probe so as to alter the power through its respective first output,

A4

said first capacitive probe being flanked by a first pair of inductive members,

each first pair of said inductive members extending across the lateral cross section located on either side of said first capacitive probe,

a second power selective capacitive probe, said second power selective capacitive probe being respectively located in the waveguide between said impedance post and a second of said the outputs,

selective means to selectively set said second power selective capacitive probe so as to alter the power through its respective second output,

said second capacitive probe being flanked by a second pair of inductive members,

each second pair of said inductive members extending across the lateral cross section located on either side of said second capacitive probe, and

the distance between said power divider and each of said power selective probes being within 0.1 of 91% of the

wavelength in the waveguide at the center frequency of the operating bandwidth.

A1

Claim 22. A method of dividing the power from a waveguide input to at least two outputs,

the method comprising increasing the resistance between the input and one output.

Claim 23. A method of controlling the power in a high energy electromagnetic treatment system, the system utilizing a microwave waveguide having an input and multiple outputs,

the method comprising locating an impedance post in the waveguide between the input and at least two outputs,

and moving at least a selective probe located in the waveguide between said power divider and one of said at least two outputs to selectively set said power through its respective output.